Amendments to the Claims

1-12 (cancelled)

13. (Previously presented) A transistor comprising three conductive segments of DNA molecules connected to an active core, wherein the active core comprises a fourth DNA segment, wherein a first and a second of said three conductive segments are linked to said active core via phosphorus bridges ("P-bridges"), wherein a third of said conductive segments is capactively linked to said active core via hydrogen bonds ("H-bonds"), and wherein said third segment is configured to electrically modulate current flowing across said active core through said fourth DNA segment through said P-bridges between said first and second of said three conductive segments in response to a gate voltage applied to said third conductive segment.

14. (Previously presented) The transistor of claim 13, wherein the conductive segments of DNA molecules are M-DNA conductive strands.

15. (Currently amended) The transistor of claim 13, wherein the conductive segments of DNA molecules are Poly-G or Poly-C DNA or Poly-CG DNA conductive strands.

16. (Currently amended) The transistor of claim 13, ~~wherein~~ further comprising a hopping mechanism across a tunnel junction, ~~is employed~~ for electron or exciton transfer between the pair of conductive segments and said active core.

17. (Currently amended) The transistor of claim 16, wherein said ~~hopping mechanism comprises using a P-bridge as the~~ tunnel junction is a P-bridge.

18-29 (cancelled).

30. (Currently amended) A DNA-based electronic ~~device~~ gate, comprising:

a length of a DNA or M-DNA molecule, defined by a pair of complementary strands; and

a gate structure disposed adjacent to the length of the DNA molecule;

wherein the gate structure is capacitively coupled to the length of the DNA or M-DNA molecule, ~~whereby electric charge in said length of the DNA molecule can be controlled~~ for controlling electric charge in said length of the DNA molecule, by application of [[a]] voltage or current to ~~the~~ said gate structure.

31. (Currently amended) The electronic ~~device~~ gate of claim 30 wherein the length of the DNA molecule comprises one strand of the pair of complementary strands ~~defining the DNA molecule structure~~.

32. (Currently amended) The electronic ~~device~~ gate of claim 30 wherein the length of the DNA molecule comprises a double strand DNA molecule segment.

33. (Currently amended) The electronic ~~device~~ gate of claim 30, wherein ~~the electric charge in the length of the DNA molecule is provided via~~ source and drain contacts ~~that~~ are disposed on the length of the DNA molecule, for allowing the transfer of an electric charge in said length.

34. (Currently amended) The electronic ~~device~~ gate of claim ~~30~~ 33, wherein the source and drain contacts comprise a complex of metal ions and DNA molecules (M-DNA).

35. (Currently amended) The electronic ~~device~~ gate of claim ~~30~~ 33, wherein the source and drain contacts comprise Poly-G or Poly-C or Poly-GC type DNA materials.

36. (Currently amended) ~~The electronic device of claim 30 which is further disposed in~~ An electronic logic circuit, comprising a DNA-based electronic gate, said electronic gate consists of:

a length of a DNA molecule, defined by a pair of complementary strands; and

a gate structure disposed adjacent to the length of the DNA molecule;

wherein the gate structure is capacitively coupled to the length of the DNA molecule, for controlling electric charge in said length of the DNA molecule, by application of voltage or current to said gate structure.

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